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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/844,175	04/27/2001	Warren M. Farnworth	MI22-1703	4157

21567 7590 05/10/2002

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EXAMINER

KOBERT, RUSSELL MARC

ART UNIT

PAPER NUMBER

2829

DATE MAILED: 05/10/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/844,175

Applicant(s)

FARNWORTH ET AL.

Examiner

Russell M Kobert

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 31-42 and 54-61 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 31-35, 37-42, 54-57, 60 and 61 is/are rejected.
- 7) ☒ Claim(s) 36, 58 and 59 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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1. Applicants' amendment filed February 28, 2002 canceling all pending non-elected claims, claims 43-53, is hereby acknowledged.

2. Applicant's arguments filed February 28, 2002 have been fully considered but they are not persuasive. Blonder et al continues to read on at least claims 31-33, 35, 37-42, 54, 55, 60 and 61. Applicants appear to be arguing the relevance of Figures 2 and 3 in Blonder et al to the presently claimed invention. However, further review of Blonder et al discloses other embodiments, specifically Figures 5-7 that is considered to read on the claimed invention.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 31-33, 35, 37-42, 54, 55, 60 and 61 are rejected under 35 U.S.C. 102(b) as being anticipated by Blonder et al (4937653).

Blonder et al anticipates a removable electrical interconnect apparatus (Figures 5-7) for removably engaging electrically conductive pads (24) on a semiconductor substrate (101) having integrated circuitry fabricated therein, the apparatus comprising: a substrate (10); and an engagement probe (surface of triangular shaped objects shown in Figures 6-7) projecting from the substrate to engage a single conductive pad (24) on

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a semiconductor substrate (101) having integrated circuitry (col 3, ln 59-60) formed in the semiconductor substrate, the engagement probe having an outer surface comprising an apex (top portion of triangular shaped objects) in the form of at least one knife-edge line (see Figure 5, center line, representing knife-edge line, separating sides that slope downward to the bottom 45) sized and positioned to extend elevationally above a surface (approximate surface 13) of the substrate to engage the single conductive pad; as recited in claim 31.

As to claim 32, Blonder et al further anticipates the engagement probe is formed on a projection (interior of triangular shaped objects shown in Figures 6-7) from the substrate.

As to claim 33, Blonder et al further anticipates the knife-edge line projects from a penetration stop plane (approximate surface 13).

As to claim 35, Blonder et al further anticipates the engagement probe is formed on a projection (interior of triangular shaped objects shown in Figures 6-7) from the substrate, the knife-edge line projecting from a penetration stop plane (approximate surface 13) on the projection.

As to claim 37, Blonder et al further anticipates outermost portions of the electrically conductive apexes constitute a first electrically conductive material (gold-plated nickel), and wherein the conductive pads for which the apparatus is adapted have outermost portions constituting a second electrically conductive material (gold pads); the first and second electrically conductive materials being different (col 5, ln 57-61 and col 7, ln 63 – col 8, ln 6).

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As to claim 38, Blonder et al further anticipates the engagement probe is formed from a semiconductor substrate (col 7, ln 49-59).

As to claim 39, Blonder et al further anticipates the knife-edge line includes an outer conductive layer (gold-plated nickel noted at col 7, ln 63 – col 8, ln 6)).

As to claim 40, Blonder et al further anticipates the outer surface (14) includes plural knife-edge lines (see Figure 5, center lines of nested L's, representing knife-edge lines, separating sides that slope downward to the bottom 45; col 5, ln 39-47) configured to engage the single conductive pad.

As to claim 41, Blonder et al further anticipates the engagement probe is formed from a semiconductor substrate (col 7, ln 49-59) and the outer surface (14) includes plural knife-edge lines (see Figure 5, center lines of nested L's, representing knife-edge lines, separating sides that slope downward to the bottom 45; col 5, ln 39-47) configured to engage the single conductive pad.

As to claim 42, Blonder et al further anticipates the engagement probe is formed from a semiconductor substrate (col 7, ln 49-59) and the outer surface (14) includes plural knife-edge lines (see Figure 5, center lines of nested L's, representing knife-edge lines, separating sides that slope downward to the bottom 45; col 5, ln 39-47) configured to engage the single conductive pad and the knife-edge lines include outer conductive layers (col 5, ln 64-68).

Blonder et al further anticipates a removable engagement probe (Figures 5-7) having an outer surface (14) comprising an apex (top portion of triangular shaped objects) in the form of at least one knife-edge line (see Figure 5, center line,

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representing knife-edge line, separating sides that slope downward to the bottom 45) sized and positioned to engage a single conductive pad (24); and wherein the knife-edge line projects from a penetration stop plane (approximate surface 13); as recited in claim 54.

As to claim 55, Blonder et al further anticipates the at least one knife-edge line is formed on a projection (interior of triangular shaped objects shown in Figures 6-7) from a substrate.

As to claim 60, Blonder et al further anticipates outermost portions of the electrically conductive apexes constitute a first electrically conductive material (gold-plated nickel), and wherein the conductive pads for which the probe is adapted have outermost portions constituting a second electrically conductive material (gold pads); the first and second electrically conductive materials being different (col 5, ln 57-61 and col 7, ln 63 – col 8, ln 6).

As to claim 61, Blonder et al further anticipates the probe is fabricated from a semiconductor substrate (col 7, ln 49-59).

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 34 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blonder et al (4937653).

Blonder et al shows the knife-edge line projecting from a penetration stop plane (approximate surface 13), the knife-edge line having a tip (top portion of triangular shaped objects in Figures 6-7) and a having a base (that portion of the triangular shaped objects that meet approximately at surface 13) at the penetration stop plane as mentioned in claims 34 and 57.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have placed the tip a distance from the penetration stop plane of about one-half the thickness of the conductive pad which the apparatus is adapted to engage as mentioned in claims 34 and 57 because the modification does not provide any unexpected, or nonobvious result and would have been one of numerous parameters chosen by the ordinary skilled artisan during routine experimentation.

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Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Swain et al., 33 C.C.P.A. (Patents) 1250, 156 F. 2d 239, 70 USPQ 412 ; Minnesota Mining and Mfg. Co. v. Coe, 69 App. D.C. 217, 99 F. 2d 986, 38 USPQ 213 ; Allen et al. v. Coe, 77 App. D. C. 324, 135 F. 2d 11, 57 USPQ 136 .

8. Claim 56 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blonder et al (4937653) in view of Reid et al (4585991).

Reid et al shows (Figure 1) the outer surface comprises a plurality of apexes having respective tips (top portion of item 1) and bases (location approximate to where top portion of substrate 3 meets triangular shaped objects), and the penetration stop plane (top portion of substrate 3) is intermediate the bases and substantially parallel to a surface (lower portion of substrate 3) of a substrate; as mentioned in claim 56.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined the teaching of Blonder et al with that of Reid et al to make the claimed invention because both teach the forming of a silicon substrate into a structure comprising a plurality of triangular shaped objects having electrically conductive apexes for contacting a pad or pads of a semiconductor device.

9. The following is a statement of reasons for the indication of allowable subject matter:

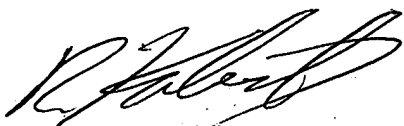
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Claims 36, 58 and 59 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. A knife-edge line formed on a projection from a substrate wherein a penetration stop plane rests on the projection as further described in claims 36, 58 and 59 has not been found. It is further noted that the examiner's reasons are understood to be predicated upon consideration of each of the claims as a whole, and not upon any specific elements of the claims.

10. A shortened statutory period for response to this action is set to expire three month(s) from the date of this letter. Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russell Kobert whose telephone number is (703) 308-5222.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956.



Russell M. Kobert
Patent Examiner
Group Art Unit 2858
May 7, 2002



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